Research Report

Effects of Racial Diversity on Complex Thinking in College Students

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ABSTRACT—*An experiment varying the racial (Black, White) and opinion composition in small-group discussions was conducted with college students (N = 357) at three universities to test for effects on the perceived novelty of group members' contributions to discussion and on participants' integrative complexity. Results showed that racial and opinion minorities were both perceived as contributing to novelty. Generally positive effects on integrative complexity were found when the groups had racial- and opinion-minority members and when members reported having racially diverse friends and classmates. The findings are discussed in the context of social psychological theories of minority influence and social policy implications for affirmative action. The research supports claims about the educational significance of race in higher education, as well as the complexity of the interaction of racial diversity with contextual and individual factors.*

Previous research has found that racially diverse educational environments are associated with positive intellectual and social outcomes for college students (Astin, 1993; Chang, 1999; Gurin, 1999; Smith & Associates, 1997). Racial diversity in the student body is linked to the likelihood that a student will interact with someone of a different race or ethnicity and engage in discussions of racial or ethnic issues. Frequent interaction across racial lines and discussion of racial and ethnic issues positively predicts student retention, intellectual and social self-concept, and overall satisfaction with college (Gurin, 1999; Smith & Associates, 1997). The existing evidence, however, is based largely on quasi-experimental or correlational designs using self-report data. No study to date has randomly assigned students to conditions of racial diversity and directly examined cognitive outcomes.

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This topic has implications for both theory and social policy. The study of cognitive responses to group dynamics is an important area in social and personality psychology (Gruenfeld, 1995; Gruenfeld & Hollingshead, 1993; Levine & Resnick, 1993). The question of the empirical merits of race-conscious approaches to diversifying colleges and universities has also become prominent in recent years in the face of legal challenges to affirmative-action policies (Chang, Witt, Jones, & Hakuta, 2003). In the study reported here, we aimed to advance the scientific understanding of the educational effects of race through a controlled, randomized experiment measuring the impact of racial diversity on the complexity of thinking in college students.

DIVERSITY AND COMPLEX THINKING

Research in the areas of organizational behavior and group dynamics has generally shown that heterogeneity of group members typically yields better problem solving than does homogeneity of group members (Nemeth & Wachtler, 1983). Although homogeneity of group members increases solidarity and cohesiveness, these same positive effects may ironically lead homogeneous groups to be ultimately less productive.

Several important theoretical constructs undergird these observations. One of these is *groupthink* (Janis, 1972). The idea here is that cohesiveness and solidarity, which can fuel increased productivity (Mullen & Copper, 1994), are also the foundation for unanimity of opinion, which results in poor decision making.

Another important theory is that of *minority influence*. Research has shown that the presence of a few group members who hold opinions that are different from those of the majority leads to increased divergent thinking and perspective taking (Nemeth, 1992). Experimental studies have found that group interaction between the divergent perspectives of members who hold the majority and minority opinions enhances integrative complexity among majority-opinion members (Gruenfeld, Thomas-Hunt, & Kim, 1998). Homogeneous groups are not likely to produce minority opinions; heterogeneity of groups increases the likelihood of minority influence.

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A racially diverse group may also be characterized by a divergence in backgrounds, values, attitudes, and experiences that presents individuals in the group with novel situations. The novel perspective introduced by racial diversity may be either actual or perceived. In the current study, we examined the effects of diversity on the perceived novelty of individuals' contributions to a group discussion.

We used as our main outcome the construct of *integrative complexity* (IC), which refers to the degree to which cognitive style involves the differentiation and integration of multiple perspectives and dimensions (Suedfeld, Tetlock, & Streufert, 1992). Simple reasoning (low IC) occurs when a single dimension (e.g., good-bad) is used to consider an issue, that is, when there is no differentiation. Low-IC individuals tend to utilize simple, rigid, and often evaluative reasoning when interpreting events and making decisions. At an intermediate level of IC, individuals recognize the existence of alternative perspectives, but see them as independent and unrelated; that is, at this level there is differentiation but not integration of perspectives. At the highest level of IC, there is recognition of the trade-offs among perspectives and solutions. IC has been used in a wide body of literature in social and personality psychology (Suedfeld et al., 1992). Higher IC has been found to be associated with higher grades among college students (Gruenfeld & Hollingshead, 1993).

Two aspects of the experimental design are particularly appropriate for studying the effects of diversity in college environments. First, the focus on IC as an outcome variable addresses the development of critical thinking skills, perhaps the defining element of a collegiate education. Second, the focus on the effects of peer interaction is appropriate because peer interaction is recognized as perhaps the most influential source of change in college (Astin, 1993; Feldman & Newcomb, 1969; Pascarella & Terenzini, 1991).

METHOD

For this study, White college students were randomly assigned to small-group discussions in a 2 × 2 factorial design. The two independent variables were group racial composition and group opinion composition vis-à-vis a target social issue. The main outcome variable was the IC of students' thinking about the target social issue. The experimental conditions were created by using research collaborators who acted as participants in the discussion groups. Each group included one collaborator, who was either Black or White and followed a predetermined script that either agreed or disagreed with the opinions indicated by the White participants on a prior screening survey. Thirty-one collaborators were used in the experiment; all were blind to the purposes of the study. The study was conducted at three selective research universities. Participants were recruited through campus flyers and e-mails. If they expressed interest, they were given a questionnaire that collected information on their race; background characteristics, including contact with racially diverse people[1]; and opinions on several social issues. Participants who agreed with the most prevalent position on one of two target social issues (against child-labor practices in developing countries or in favor of the death penalty) were asked to participate in a subsequent experimental session. Participants were blind to the purposes of the study and were debriefed subsequent to participation.

A total of 357 White participants (135 men, 222 women; mean age = 20.0, SD = 3.6) were assigned to same-sex experimental groups consisting of 3 participants and 1 research collaborator. At the start of each session, a facilitator led the participants and the collaborator into the laboratory and sat them around a table. The facilitator then handed out a written description of the target social issue for which the participants had been selected on the basis of the opinion they expressed on the screening survey. Participants read the prompt silently. Next, before any discussion took place, participants were asked to indicate their agreement or disagreement with the issue and to write a short essay describing their support for or opposition to the issue (the prediscussion essay). They were given 15 min. Most of the participants (85%) indicated that they held the same position as they did on the screening survey.

After completing the first essay, participants were asked to discuss their opinions on the issue. The facilitator asked each participant to begin by orally stating his or her opinion. The participants then engaged in an unstructured 15-min discussion during which the collaborator followed a script written to express agreement or disagreement with the opinions the participants had indicated on the screening survey. Because some of the participants expressed opinions that differed from those they had indicated on the screening survey, the variable for group opinion composition was expanded from two levels (collaborator agreed with everyone vs. disagreed with everyone) to four levels (collaborator agreed with everyone vs. agreed with 2 other group members vs. agreed with 1 group member vs. disagreed with everyone). Of the 357 participants, 108 were in groups in which the collaborator disagreed with everyone (i.e., extreme opinion-minority condition), and 123 were in groups in which the collaborator agreed with everyone (i.e., extreme opinion-majority condition). For 60 participants, the collaborator agreed with only 1 other group member, and for the remaining 66 participants, the collaborator agreed with 2 of the other group members. After the discussion, participants were given 15 min to write a second essay on the same topic (the postdiscussion essay).

After completing the second essay, participants were asked to indicate their agreement or disagreement with a different social issue (either child-labor practices or the death penalty, the alternate of the first issue) and to write a short essay describing their support of or opposition to this second issue. We call this the *transfer essay* because it tested whether any stimulation of complex thinking due to the group discussion on the first topic transferred to thinking on a second topic. Participants were given 15 min to complete their essay. They were subsequently asked to complete a questionnaire in which they rated the contribution of each member of their group, including the collaborator, to the earlier discussion. Participants rated how much each group member made others think about the issue in different ways, introduced a novel perspective to the discussion, and was influential in the group. We averaged these three ratings of the collaborator (α = .90) to form an index of perceived novelty (scale range from 1 to 7).

All essays were rated for IC (scale range from 1 to 7) by three independent judges who were blind to the purposes of the experiment. Procedures followed those established by Suedfeld et al. (1992). The interrater reliability was .70 for the prediscussion measure, .62 for the postdiscussion measure, and .66 for the transfer measure. Because the postdiscussion measure is in essence a change measure, and because

[1]For this measure, we averaged responses to two items measuring the racial diversity of a student's close friends and classmates (scale range from 0, *no contact*, to 4, *100% contact*; M = 1.72).

it is acceptable that change scores have relatively low reliability (Overall & Woodward, 1975), the .62 value is methodologically acceptable. Moreover, because raters may have focused on different parts of the essays, interrater reliability may underestimate the reliability of the measure.

RESULTS

Four different outcome variables were analyzed. First, we examined whether collaborator race and collaborator opinion had effects on perceived novelty. Second, we tested for the effect of collaborator race on IC in the prediscussion measure (i.e., before the collaborator had the opportunity to express an opinion). Third, we tested for the effects of collaborator race and collaborator opinion on IC in the postdiscussion measure. Fourth, we tested for the effects of collaborator race and opinion on IC in the transfer measure. All analyses were multilevel regression analyses that allowed initially for group-level effects. When group effects were not present, they were dropped from the model. We also tested for main effects of university site, issue, age, gender, and contact with racially diverse people, as well as interactions of these variables with collaborator race. Only statistically significant results are reported.

Perceived Novelty

There were statistically significant main effects for collaborator race and collaborator opinion on perceived novelty, $t(108) = 2.05$, $p = .042$, $d = 0.29$, and $t(108 = -6.39$, $p < .001$, $d = -1.07$, respectively. That is, participants judged the collaborator's contribution to the discussion as more novel when the collaborator was Black, even though the White collaborator followed the same script in the group discussion (least squares mean = 5.56 for the Black collaborator and 5.27 for the White collaborator). In addition, participants who were in opinion-minority groups rated the collaborator higher for perceived novelty ($M = 5.95$) than participants who were in opinion-majority groups ($M = 4.88$). The interaction of these factors was not statistically significant, but an examination of the means suggested that when the collaborator agreed with everyone else in the group, the Black collaborator was seen as more novel than the White collaborator.

Prediscussion Integrative Complexity

The IC of the prediscussion essays was analyzed for effects of the collaborator's race and participants' background characteristics. The effect of collaborator opinion was not considered because the participants were unaware of the positions of the other participants or the collaborator at this point in the experiment. A marginally significant main effect of collaborator race was indicated ($M = 1.83$ for the White collaborator and 1.94 for the Black collaborator) $t(352) = 1.70$, $p = .09$, $d = 0.18$. No significant interactions of race with university site, issue, age, gender, and contact with racially diverse people were detected.

Postdiscussion Integrative Complexity

We found a main effect for collaborator opinion on postdiscussion IC, $t(351) = -3.91$, $p < .001$, $d = -0.51$, such that participants in groups in which the collaborator held a minority opinion showed higher IC ($M = 1.88$) than those in groups in which the collaborator agreed with the 3 members of the group ($M = 1.63$). There was no effect of collaborator race, nor did it interact with other variables. There was, however, a significant main effect for diversity of racial contact; participants reporting higher levels of diverse racial contact showed higher levels of IC, $t(351) = 2.47$, $p = .014$, $r = .13$.

Transfer

There were no main effects of collaborator race or collaborator opinion on transfer IC. As for the postdiscussion essay, contact with racially diverse people had a positive effect on IC, $t(352) = 2.66$, $p = .008$, $r = .14$. The analysis of interaction effects indicated a significant interaction of collaborator race and issue, $t(352) = -1.98$, $p = .049$. Among participants who wrote the transfer essay on the topic of child labor, those who had a Black collaborator in the group had higher IC scores ($M = 1.91$) than those with a White collaborator ($M = 1.52$; $d = 0.73$); however, among participants who wrote on the topic of the death penalty, the race difference was much smaller (Ms = 1.71 and 1.68 for Black and White collaborators, respectively; $d = 0.06$).

DISCUSSION

We found that the presence of a Black collaborator in a group of White participants generally led to greater perceived novelty of the collaborator and a greater level of IC. Our results also indicate that the presence of a minority opinion stimulates greater IC, a finding consistent with social psychological theories of minority influence. We also found that self-reported racially diverse contacts were significantly and positively related to IC. These results are highly consistent with earlier nonexperimental research and findings based on self-reported data (Astin, 1993; Gurin, 1999) and support claims about the importance of race as a factor in higher education (Chang et al., 2003). Moreover, the finding that the racial diversity of a student's close friends and classmates was more strongly associated with IC than the racial diversity of the discussion group implies that prolonged contact with racially diverse others may have stronger effects on students' complex thinking than the more limited contact with racially diverse others that might occur in a single discussion group. However, given the nonexperimental nature of this variable, causal inferences regarding it are weaker than our conclusions regarding the effects of race of the collaborator.

The main contributions of this study are in its use of random assignment and a cognitive measure of the outcome (IC). Although we found robust effects of racial diversity on perceived novelty, the effect of racial diversity on IC was interactive in one analysis, of marginal significance in another, and not significant in a third. These promising results warrant additional experimentation to more fully determine the effect of racial diversity on complex thinking.

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